

In the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A magnetic detecting element comprising:
a multilayer laminate including a first antiferromagnetic layer, a pinned magnetic layer, a nonmagnetic material layer, and a first free magnetic layer in that order from a bottom thereof;
a pair of second antiferromagnetic layers disposed in a track width direction, respectively, at each side of the multilayer laminate in the track width direction; and
a continuous second free magnetic layer disposed ~~from an~~ over each upper surface of the pair of second antiferromagnetic layers ~~to and~~ an upper surface of the first free magnetic layer, ~~the second free magnetic layer distinct from the first free magnetic layer; and~~
a pair of third antiferromagnetic layers above the second free magnetic layer in a region opposing the second antiferromagnetic layer in a thickness direction, respectively.
2. (Original) A magnetic detecting element according to Claim 1, further comprising a nonmagnetic layer between the first free magnetic layer and the second free magnetic layer.
3. (Original) A magnetic detecting element according to Claim 2, wherein the nonmagnetic layer comprises at least one element selected from the group consisting of Cu, Ru, Re, Pd, Os, Ir, Pt, Au, Rh, and Cr.
4. (Currently Amended) A magnetic detecting element according to Claim 1, further comprising a pair of ferromagnetic layers between the pair of second antiferromagnetic layers and the second free magnetic layer, respectively.
5. (Currently Amended) A magnetic detecting element according to Claim 4, further comprising a nonmagnetic layer between the pair of ferromagnetic layers and the second free magnetic layer, respectively.

6. (Previously Presented) A magnetic detecting element according to Claim 1, further comprising a specular layer on an upper surface of the second free magnetic layer in at least a region opposing the multilayer laminate in a thickness direction.

7. (Original) A magnetic detecting element according to Claim 6, wherein the specular layer comprises: an oxide selected from the group consisting of Fe-O, Ni-O, Co-O, Co-Fe-O, Co-Fe-Ni-O, Al-O, Al-Q-O, and R-O; a nitride selected from the group consisting of Al-N, Al-Q'-N and R'-N; or a semimetallic whistler alloy, wherein Q is at least one selected from the group consisting of B, Si, N, Ti, V, Cr, Mn, Fe, Co, and Ni, R is at least one selected from the group consisting of Cu, Ti, V, Cr, Zr, Nb, Mo, Hf, Ta, and W, Q' is at least one selected from the group consisting of B, Si, O, Ti, V, Cr, Mn, Fe, Co, and Ni, and R' is at least one selected from the group consisting of Ti, V, Cr, Zr, Nb, Mo, Hf, Ta, and W.

8. (Original) A magnetic detecting element according to Claim 1, further comprising a specular layer between the first free magnetic layer and the second free magnetic layer.

9. (Previously Presented) A magnetic detecting element according to Claim 1, further comprising a backed layer on an upper surface of the second free magnetic layer in at least a region opposing the multilayer laminate in a thickness direction.

10. (Original) A magnetic detecting element according to Claim 9, wherein the backed layer comprises an element selected from the group consisting of Cu, Au, Cr, and Ru.

11. (Cancelled)

12. (Currently Amended) A magnetic detecting element according to Claim 14, further comprising a pair of ferromagnetic layers between the pair of third antiferromagnetic layers and the second free magnetic layer, respectively.

13. (Currently Amended) A magnetic detecting element according to Claim 14, further comprising a fourth antiferromagnetic layer between the pair of third antiferromagnetic layers and the second free magnetic layer.

14. (Currently Amended) A magnetic detecting element according to Claim 14, ~~wherein the third antiferromagnetic layer possesses a space in the track width direction dividing the third antiferromagnetic layer in the track width direction above the second antiferromagnetic layer and wherein a nonmagnetic layer is in the space~~ further comprising a nonmagnetic layer in a space between the pair of third antiferromagnetic layers in the track width direction above the pair of second antiferromagnetic layers, respectively.

15. (Previously Presented) A magnetic detecting element according to Claim 1, wherein an angle θ_1 between a lower surface of the multilayer laminate and each side surface of the multilayer laminate is in the range of 60° to 90°.

16. (Currently Amended) A magnetic detecting element according to Claim 1, further comprising ~~an~~ a pair of electrode layers above the second free magnetic layer in a region opposing the pair of second antiferromagnetic layer in a thickness direction, respectively.

17. (Original) A magnetic detecting element according to Claim 1, further comprising:

an upper electrode above the multilayer laminate; and
a lower electrode under the multilayer laminate.

18. (Currently Amended) A magnetic detecting element according to Claim 17, further comprising an insulating layer between the lower electrode layer and the pair of second antiferromagnetic layers and between the pair of second antiferromagnetic layers and each end surface of the multilayer laminate, respectively.

19. (Currently Amended) A magnetic detecting element according to Claim 17, further comprising ~~an~~ a pair of insulating layers between the upper electrode layer and the second free magnetic layer in a region opposing the pair of second antiferromagnetic layers in a thickness direction, respectively.

20. (Currently Amended) A magnetic detecting element according to Claim 11, further comprising ~~an~~ a pair of insulating layers between an upper electrode layer and the pair of third antiferromagnetic layers, respectively.

21-78. (Cancelled)